

An Open Source Software Directory for Aeronautics and Space

Andreas Schreiber, Michael Meinel, Tobias Schlauch

German Aerospace Center (DLR)

Roberto Galoppini

SourceForge



Knowledge for Tomorrow



Outline

- DLR
- Software at DLR
- Software Catalogue
- Allura
- DLR Software Portal



DLR

German Aerospace Center



- Research Institution
- Space Agency
- Project Management Agency



DLR

Locations and employees

8000 employees across
33 institutes and facilities at

■ 16 sites.

Offices in Brussels, Paris,
Tokyo and Washington.



DLR

Research Areas

Major research areas of DLR institutes

- Aeronautics
- Space
- Transportation
- Energy
- Security



Software research and development

- Simulation and Software Technology division

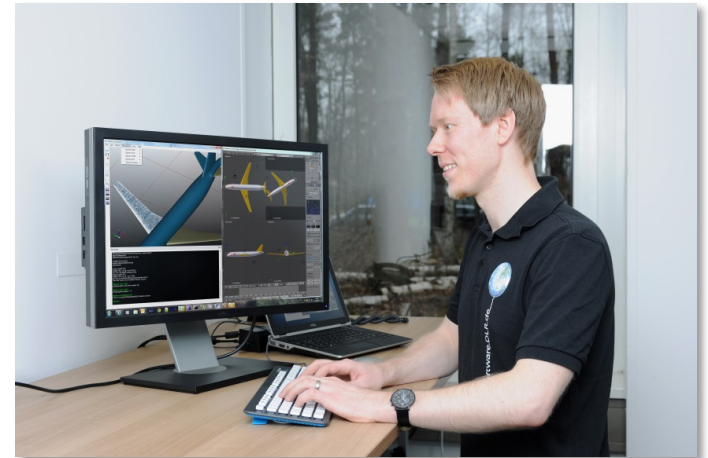


Software at DLR

Size and Amount

Some numbers...

- More than 1200 employees are developing software
- More than 100 Million EURO personnel costs per year
- DLR is one of Germany largest software developers



Software at DLR

Typical Software in Space and Aerospace

Simulation Software

- High performance computing and scientific computing

Mission-critical software

- Real-time | embedded | decision making software

Supporting software

- Data | Workflow | Knowledge management

Administrative software

- Web-based intranet software for accounting and project management



Software at DLR

Characteristics

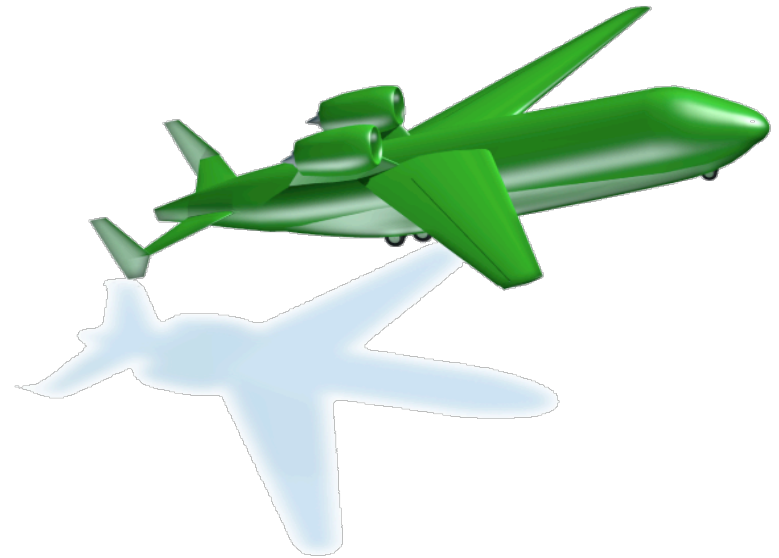
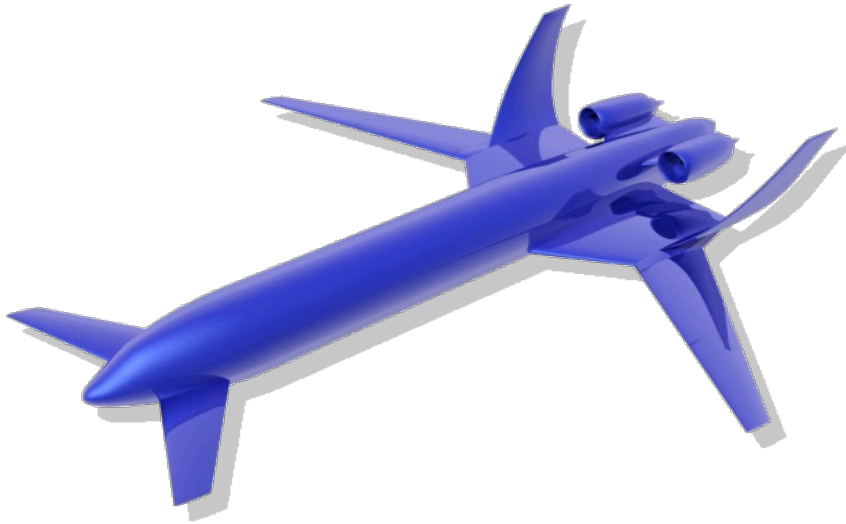
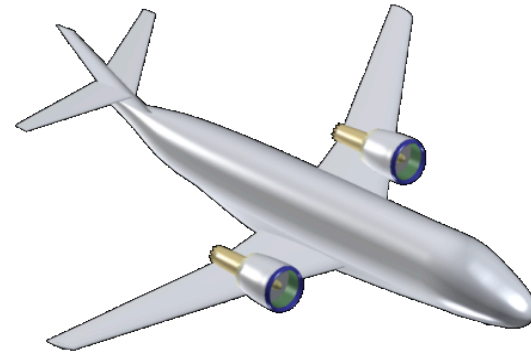
- Most software developed at DLR is non-standard software
- Often very special and specific requirements
- A great many number of software projects
- Open Source or proprietary software licenses
- Overview of existing software is extremely difficult



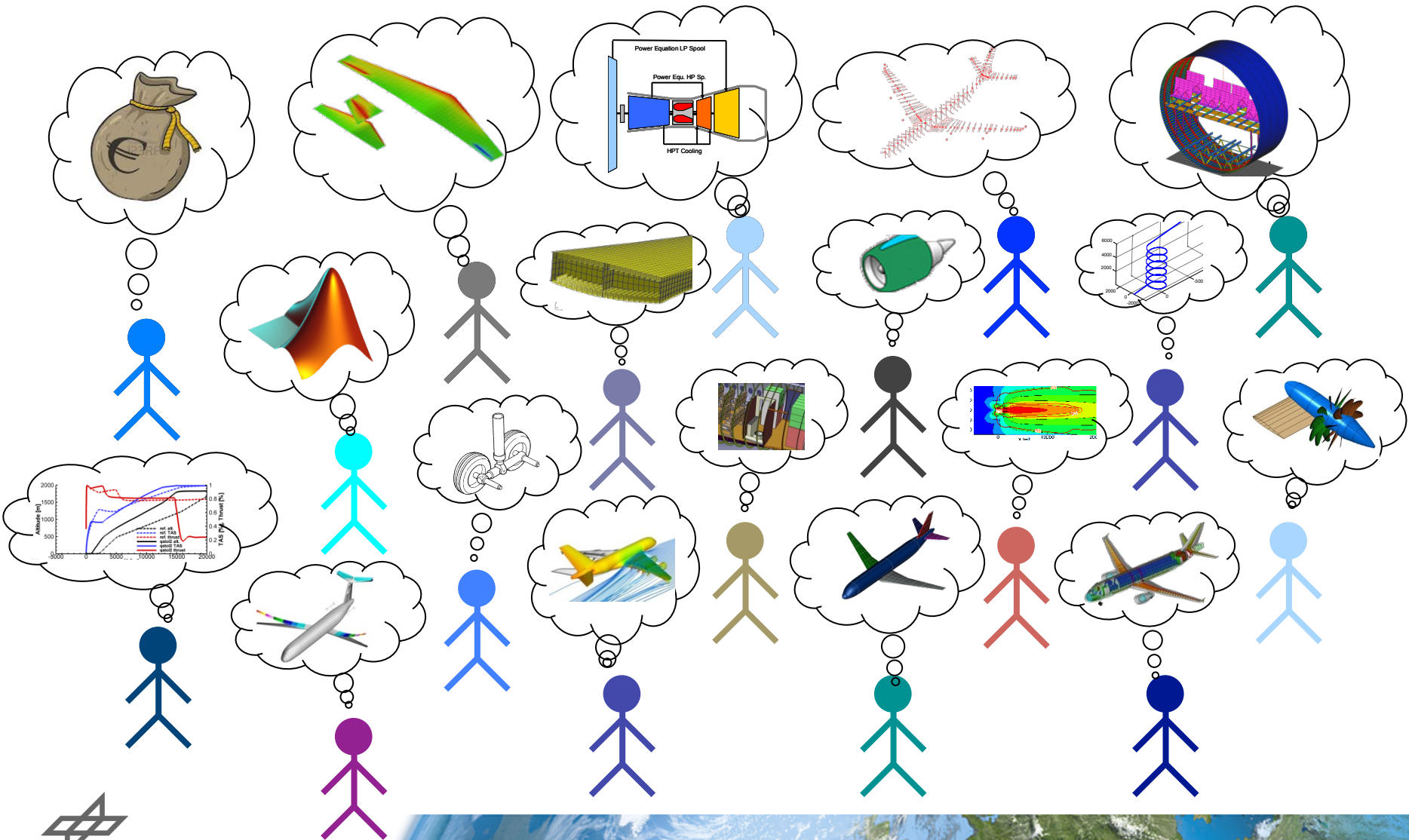
Example

Future Aircraft Design

Complex task with many involved scientific and engineering disciplines



Future Aircraft Design



Software Engineering Strategy

Dealing with DLRs Software Characteristics

Methods and Tools

- Development processes tailored for scientists, documentation via Web-based tools
- Development tools seamlessly integrated with working environment
- Tools are available and accessible easily via intranet for every employee
- Standard trainings offered for most important tool chains and software technologies



Software Engineering Strategy

Knowledge Management

Exchange of knowledge and information

- Network of software engineering representatives
 - Information sharing via intranet and workshops
- Wiki for documentation and collaboration
- Question & Answer system (such as *Stack Overflow*)
- Software catalogue

Disclaimer: This list is intentionally not complete!



Software Catalogue

Goal and Essential Requirements

Intention and goal

- Employees can get an overview of all software software packages, tools, and products developed at DLR
- To prevent double development of software

Essential requirements

- Searching for existing software
- Browsable directory of all software



Software Catalogue

Major Requirements

Technical requirements

- Web-based
- Access control
- Basic project information
- Tagging
- Screenshots and diagrams
- Public page
- Code hosting
- Collaboration and documentation
- Commenting and rating
- Social media integration
- Scalability



Software Catalogue

First Version

DLR – Software-Katalog

https://www.sistec.dlr.de/webapp/swcat/index.php?page=list&id=&edit=&field%5B%5D=modified&find%5B%5D=-6

Software-Katalog 16.04.2011 [Druck-Version](#)




Benutzer: maas

[Neue Software](#)
[Bearbeiten](#)
[Löschen](#)
[Software-Standards](#)
[Abmelden](#)

Suche:

(* für alle Einträge)
[Profilsuche](#)
[Aktuelle Einträge](#)
[Berechtigungen](#)
[Forum](#)

Suche nach Software-Einträgen **der letzten 6 Monate** liefert folgende Ergebnisse:

Name	Beschreibung	Kategorie	DLR-OE
 Python WebDAV Library	Die in Python entwickelte Bibliothek erlaubt die client-seitige Nutzung des WebDAV-Protokolls. Weiterhin werden die Funk...	Kommunikation	SC-VK
 SAFE	Software für die Bedienung der SAFE-Hardware (Streulicht-Analysator mit flexibler Endoskoptechnik) - Datenaufnahme und A...	Signal-/Datenverarbeitung	AT-TM
 GeReLEO Communication	Data Link Layer, Resource Management and Signaling software for data relay satellite system....	Kommunikation	KN-DN

Such-Ergebnisse einschränken durch
 Suche im Feld nach

Aktuelles:

- DLR Software-Standards: Zur Zeit Einschränkung de...
- Die Anmeldung am Software Katalog erfolgt nun über...
- Die DLR Basis-Standards sind mit dem Software-Katalog v...
- Software-Katalog jetzt im neuen Design, in Anlehnung an...
- Nutzer-Verwaltung mit Passwort-Vergabe implementiert. B...
- Neue (provisorische) Software-Kategorien stehen zur Ver...
- Einfache Profilsuche eingerichtet....
- Rechte-System implementiert, Software Logos möglic...

[Impressum](#)

SW-1.0.490 DB-1.0(145)



Software Catalogue

First Version

DLR – Software-Katalog

https://www.sistec.dlr.de/webapp/swcat/index.php?field%5B%5D=cat&find%5B%5D=11&field%5B%5D=avail&find%5B%5D=2&page=list

Software-Katalog 16.04.2011 [Druck-Version](#)

Benutzer: maas










- Neue Software
- Bearbeiten
- Löschen
- Software-Standards
- Abmelden

Suche:

(* für alle Einträge)

- Profilsuche
- Aktuelle Einträge
- Berechtigungen
- Forum

Suche im Feld "Haupt-Kategorie" UND im Feld "Verfügbar als" liefert folgende Ergebnisse:

Name	Beschreibung	Kategorie	DLR-OE
 DoE CFD	- Software für statistische Versuchsplanung (design of experiments), speziell für numerische Simulationen mit TAU - Die...	Numerische Simulation	AS-CA
 FLOWer	Simulation kompressibler Strömungen von Unterschall bis Überschall auf blockstrukturierten Netzen, auch zeitgenau....	Numerische Simulation	AS-CA
 FlowSimulator	The target of the FlowSimulator is to provide a common environment for high-performance, multi-disciplinary numerical si...	Numerische Simulation	SC-VK
 PADGE	Simulation kompressibler Stroemungen auf unstrukturierten Vierecks und Hexaeder Gittern mit DG Verfahren hoeherer Ordu...	Numerische Simulation	AS-CA
 POD	- Proper Orthogonal Decomposition (POD) Zerlegung - Methode, welche die stationäre Oberflächendruckverteilungen an beli...	Numerische Simulation	AS-CA
 TAU	Simulation kompressibler Strömung von Unterschall bis in den Hyperschall auf hybriden unstrukturierten Netzen, auch zeit...	Numerische Simulation	AS-CA
 THETA	Inkompressible Version des TAU Codes für Strömung in Brennkammern mit der Möglichkeit der Kopplung mit Strahlung und Ver...	Numerische Simulation	AS-CA
 THETA-ST	CFD-Software...	Numerische Simulation	VT-CS
 VFM	- Methode unterschiedlicher Eindringtiefe (Variable Fidelity Modeling) - effiziente Ermittlung von aerodynamischen Last...	Numerische Simulation	AS-CA

Such-Ergebnisse einschränken durch

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- Neue (provisorische) Software-Kategorien stehen zur Ver...
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- Rechte-System implementiert, Software Logos möglic...

[Impressum](#)

SW-1.0.490 DB-1.0(145)



Software Catalogue

First Version

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https://www.sistec.dlr.de/webapp/swcat/index.php?page=item&id=0&edit=

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Datenblatt - Neu

Basisdaten

Software-Name		
Beschreibung		
Version:	Förder-Ident.Nr:	Logo einfügen: <input type="button" value="Datei auswählen"/> <input type="button" value="Keine Date...usgewählt"/> <input type="button" value="DLR Logo"/>
Referenzliste (Anwender):	Verweise zu anderer Software: <input type="button" value="Ändern"/>	Kontakt-Personen: <input type="button" value="Ändern"/>
Homepage:	Download:	Link zum DLR Virtual Lab:

Kategorie (Mehrfach-Auswahl mit Strg)

Haupt-Kategorie: <input type="text" value="Signal-/Datenverarbeitung"/>	Anwendungs-Typen: <input type="text" value="stand-alone"/> <input type="text" value="verteiltes System"/> <input type="text" value="eingebettetes System"/> <input type="text" value="Echtzeit"/> <input type="text" value="Visualisierung"/> <input type="text" value="Simulation / Education"/>
Sub-Kategorien: <input type="text" value="Erfassung"/> <input type="text" value="Messdatenerfassung"/> <input type="text" value="Bildverarbeitung"/> <input type="text" value="3D Stereoverarbeitung"/> <input type="text" value="Aufbereitung (value adding)"/>	<input type="checkbox"/> Basis-Software (wie z.B. Flower, Tau, Tent, ...)

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- Neue (provisorische) Software-Kategorien stehen zur Ver...
- Einfache Profilsuche eingerichtet....
- Rechte-System implementiert, Software Logos möglic...



First Version Problems

Problems of the first version

- The solution was not ergonomic
- Employee acceptance was low
- Not suitable for the public
- Code (PHP) not very maintainable

Conclusion

- Development of a new version based on existing Open Source software
- Apache Allura



SourceForge.net

sourceforge

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Find, Create, and Publish Open Source software for free

TODAY:


↓ 4.343.789 DOWNLOADS

🕒 14.560 CODE COMMITS


💬 3.573 FORUM POSTS

🐛 2.736 BUGS TRACKED

👁 MORE DETAILS


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Projects Of The Month

**Staff Choice CMDBuild - CMDB for IT Asset Management**
Free software tool for configuration and management IT asset database
[Download](#)
Windows | Mac | Linux

**Community Choice VASSAL Engine**
VASSAL is a game engine for creating electronic versions of traditional board and card games. It provides support for game piece rendering and ...
[Download](#)
Windows | Mac | Linux



Apache Allura

The Software behind SourceForge.net

„Forge“ implementation

- Source Code Repositories
- Bugs & Issues
- Discussions
- Mailing Lists
- Wiki
- Blogs

Open Source, Apache project since 2013

- <https://allura.apache.org>



Allura


https://forge-allura.apache.org

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Apache Allura™

Forge software for hosting software projects




The Apache Software Foundation
<http://www.apache.org/>






[Wiki](#) [Activity](#) **[Git](#)** [Docs](#) [Mailing List \(dev\)](#) [Tickets](#) [License](#) [Sponsorship](#) [Thanks](#) [Security](#) [Apache.org](#)

[Browse Commits](#)
[Fork](#)
[Forks](#) **7**

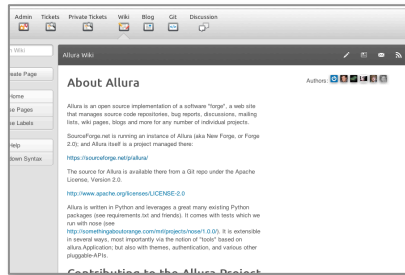
Branches
master
42cc
42cc_1532
42cc_1937
42cc_2886
42cc_3019
42cc_3581
42cc_3658
42cc_3775

Tree [7c3056] **master** **HEAD** / [History](#) 

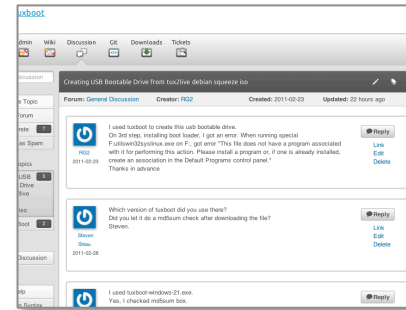
[RO](#) [HTTP](#) [Read Only access](#)

File	Date	Author	Commit
Allura	1 day ago	 Igor Bondarenko	[7c3056] [#7585] ticket:642 Move popup to prefs block
AlluraTest	2014-05-28	 Igor Bondarenko	[2392ea] [#1687] ticket:589 Add back fix for token creat...
ForgeActivity	2014-06-25	 Alexander Luberg	[4ee0a8] [#7492] corrected activity description not to d...
ForgeBlog	2014-06-28	 Tim Van Steenburgh	[948e6c] [#6930] Fix: blog post rename notification is b...
ForgeChat	2014-01-21	 Cory Johns	[5d46b7] [#4808] Clean up SourceForge references / values

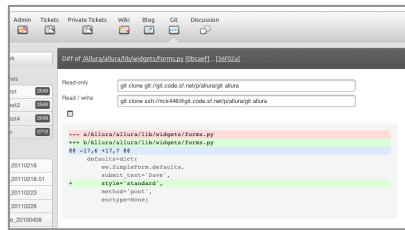
Allura Integrated Tools



Wiki

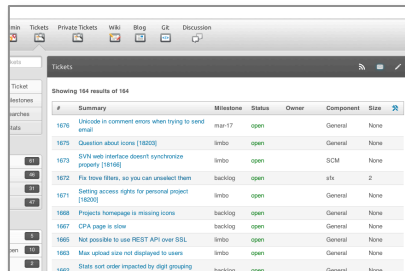


Forum

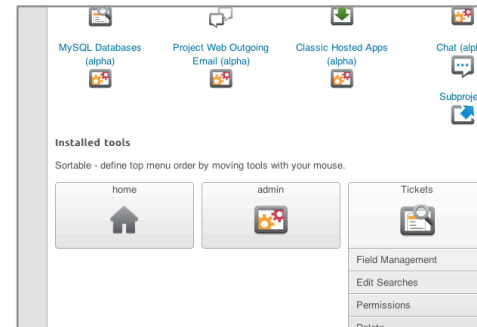


Repositories

Git, Mercurial,
Subversion



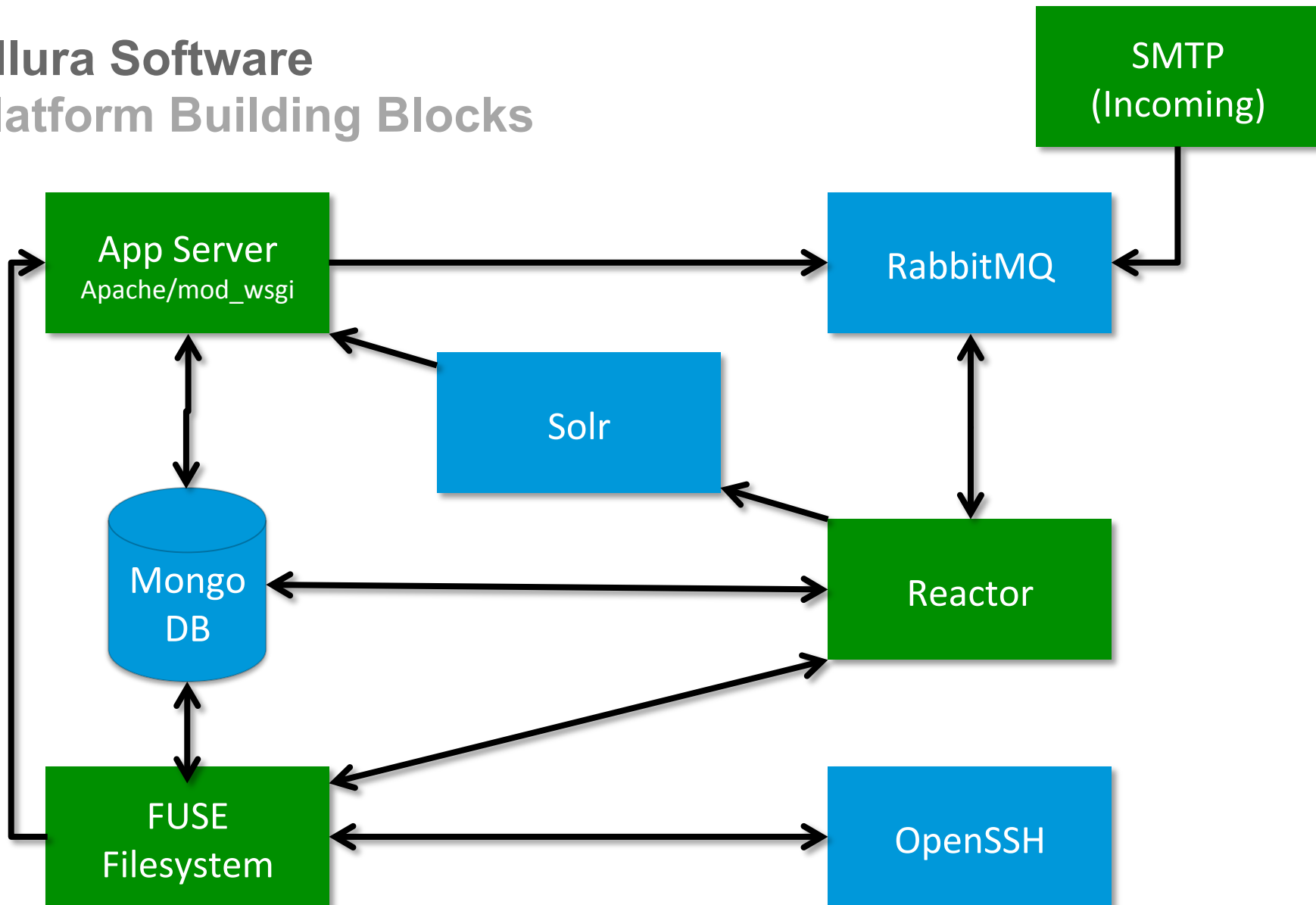
Tracker



Administration



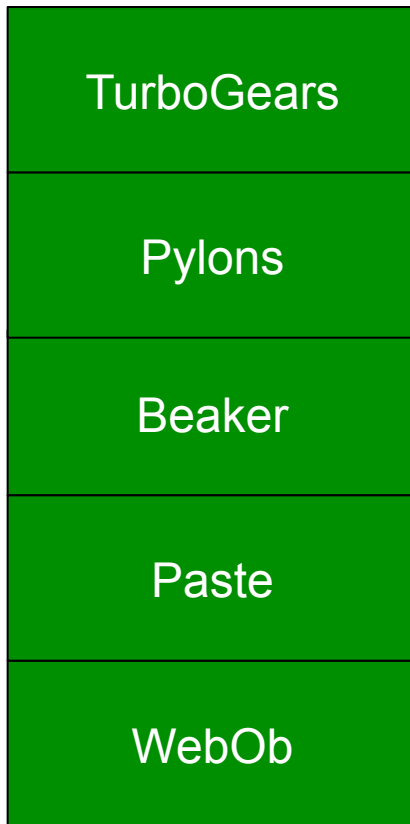
Allura Software Platform Building Blocks



Allura Software Components



WSGI Stack



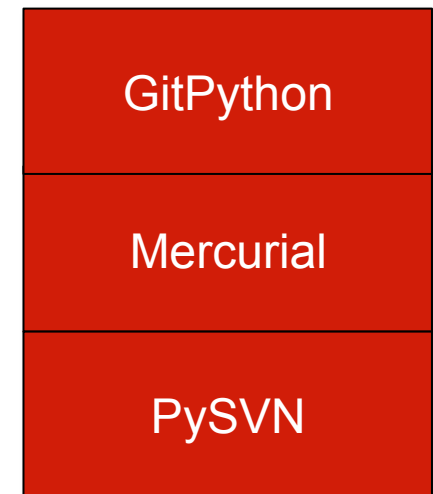
Rendering



Search



Repositories






software.DLR.de

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- ➔ All projects
- ➔ Administration and Tools
- ➔ Communication
- ➔ Control
- ➔ Knowledge and Data Management
- ➔ Signal and Data Processing
- ➔ Software Engineering
- ➔ Simulation and Modeling
- ➔ Visualization



Knowledge and Data Management

BACARDI

The Backend Catalog for Relational Debris Information (BACARDI) is the DLR's approach to a space debris database. The custom middleware components are implemented in Python using ZeroMQ and Protocol Buffer technology.



Simulation and Modeling

Simulation Model Library

Simulation Model Library (SimMoLib) is a distributed system to manage a library of simulation models. SimMoLib's main goal is to promote the preservation of knowledge that lies in simulation and calculation models and encourage reuse of those models.



Simulation and Modeling

Virtual Satellite

Designing space systems and planning space missions relies on many separated phases and disciplines. The virtual satellite aims at closing the gaps in the development life-cycle and between disciplines by using model-based systems engineering.

DLR Software Portal

<http://software.DLR.de>

Basics

- Development started in 2011
- Available for DLR employees and the public
- For Open Source as well as proprietary software



DLR Software Portal

Customization

Customization of Allura

- Web templates (DLR corporate design)
 - Metadata (project overview and basic information)
 - Categories
 - DLR site
 - Development status
 - Institute
 - License
 - Operating system
 - Programming language
 - DLR research program
- ➔ Administration and Tools
 - ➔ Communication
 - ➔ Control
 - ➔ Knowledge and Data Management
 - ➔ Signal and Data Processing
 - ➔ Software Engineering
 - ➔ Simulation and Modeling
 - ➔ Visualization



DLR Software Portal Rollout

Rollout in four major steps

- [2012:] Open to the public for searching and browsing. Access to add entries for two selected institutes of DLR and for selected users. Code hosting is disabled.
- [2013:] Access to every DLR employee for adding entries. Changed layout for project home pages, project editor, and user profile pages.
- [2014:] Extended features for faceted search and browsing.
- [2015:] Code hosting enabled. Access to registered external users (who must have an account at DLR, which is usually given to project partners or students)

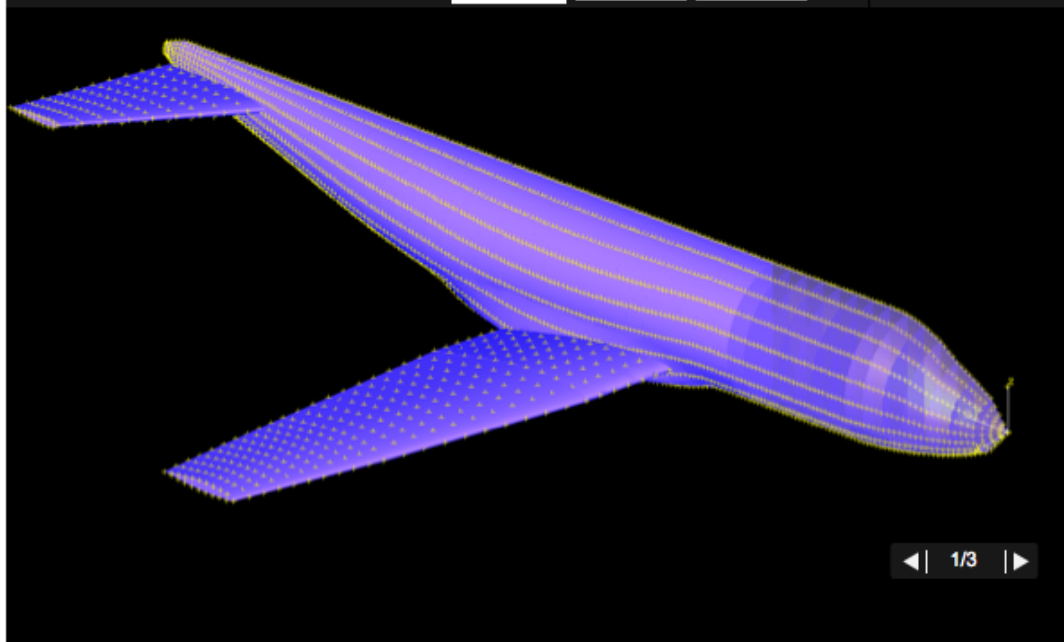
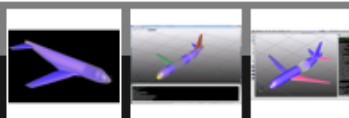


[TiGL](#)[Home](#)[software.DLR.de](#)[» Projects](#)[» TiGL](#)

TiGL

Visualization

TiGLViewer Screenshot



◀ 1/3 ▶

License

Apache Software License

Programming Language

C
C++
Python 2
Fortran
Matlab

Development Status

5 - Production/Stable

Operating System

Windows 7
Linux
OS X
Android

Research Program

L - no assignment

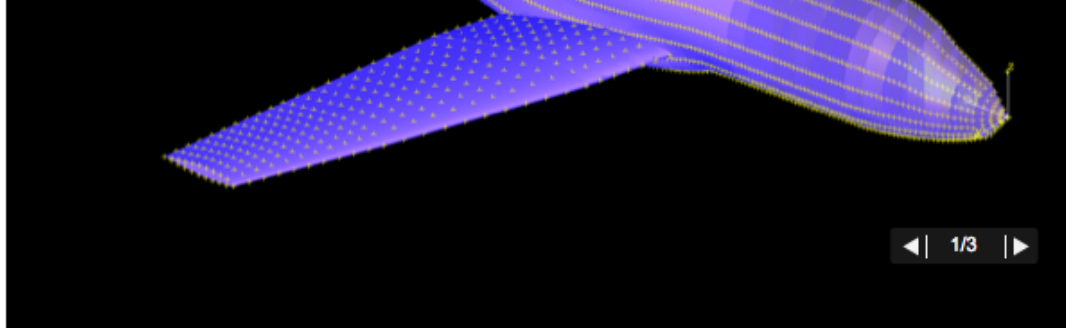
Institute

Simulation and Software Technology

The TiGL Geometry Library can be used for easy processing of geometric data stored inside CPACS data sets. TiGL offers query functions for the geometry structure. These functions can be used for example to detect how



feedback & support



The TiGL Geometry Library can be used for easy processing of geometric data stored inside CPACS data sets. TiGL offers query functions for the geometry structure. These functions can be used for example to detect how many segments are attached to a certain segment, which indices these segments have, or how many wings and fuselages the current airplane configuration contains. This functionality is necessary because not only the modeling of simple wings or fuselages but also the description of quite complicated structures with branches or flaps is targeted. The developed library uses the Open Source software OpenCASCADE to represent the airplane geometry by B-spline surfaces in order to compute surface points and also to export the geometry in the IGES/VTX format. The library provides external interfaces for C, C++, Python, MATLAB and Fortran.

For more information, please visit our project page on <http://tigl.googlecode.com>.

- ➔ Twitter
- ➔ Facebook
- ➔ Google+

- ➔ Print
- ➔ Send

Last update: 2013-08-21

Project resources

- ➔ Project homepage
- ➔ Support homepage

Project members

- ➔ Siggel, Martin



German
DLR Aerospace Center

Simulation and Software Technology

Imprint - Simulation and Software Technology

Simulation and Software Technology - Open Source

Imprint - DLR

Windows 7
Linux
OS X
Android

Research Program

L - no assignment

Institute

Simulation and Software
Technology

Site

Cologne

software.DLR.de

» Projects

» TIGL

- ➔ Metadata
- ➔ Homepage
- ➔ Screenshots
- ➔ Categorization
- ➔ Permissions
- ➔ Usergroups
- ➔ Audit Trail

Project Setup

Please set up and update all information for your project.

Important: Don't forget to set and maintain correct permissions!

Basic Project Information

Metadata Update basic project metadata, such as project name, links to other websites, a short summary of your project, the software category, and the icon. (**Info:** You can also remove your project here.)

Homepage Provide a solid description, so colleagues can figure out what the project is all about.

Screenshots Add as much screenshots, pictures, and diagrams as you like.

Categorization

Categories Categorize your project. Currently, you can categorize according to license, programming language, and DLR research program.

Access

Permissions Set permissions to groups for reading, updating, administrating or creating project content.

User groups Manage user groups for your project.

History

Audit trail Show all changes on the project information.



German
DLR Aerospace Center



DLR



software.DLR.de

» Projects

» TIGL

Metadata

- ➔ Homepage
- ➔ Screenshots
- ➔ Categorization
- ➔ Permissions
- ➔ Usergroups
- ➔ Audit Trail

Metadata Project Overview and Basic Information

Name

TIGL

This is the publicly viewable name of the project, and will appear on project listings. It should be what you want to see as the project title in search listings.

Category

Simulation and Modeling

Summary

A library for generating 3D geometries from parametrized CPACS/XML data sets

174 characters left

Add a short one or two sentence summary for your project.

Homepage

<http://code.google.com/p/tigl/>

The homepage of your project where people can find extensive documentation, downloads, presentations etc.

Support page

☐ None☒ URL<http://code.google.com/p/tigl/>

Icon



Delete Icon

or replace:

Keine Datei aus



software.DLR.de

» Projects

» TIGL

- ➔ Metadata
- ➔ Homepage
- ➔ Screenshots
- Categorization**
- ➔ Permissions
- ➔ Usergroups
- ➔ Audit Trail

Categorization Categories of the Project

DLR site

☐ DLR site :: Cologne

Augsburg

Add

Development Status

☐ Development Status :: 5 - Production/Stable

5 - Production/Stable

Add

Institute

☐ Institute :: Simulation and Software Technology

Design Organisation

Add

License

☐ License :: OSI-Approved Open Source :: Apache Software License

OSI-Approved Open Source

Academic Free License (AFL)

Add



feedback & support



DLR Software Portal

Current State

- Open for all DLR institutes
- First set of projects added
- Adding projects not mandatory yet
- Feedback by project owners
 - Many bugs and feature requests
 - New contacts within DLR and with external companies



DLR Software Portal

Current and Future Work

Technical

- Upgrade to latest version of Allura
- Faceted search
- Activation of code hosting

Organizational

- Engage DLR employees to add their projects
- Extend access to other organizations (ESA, NASA, ...)



Thank You!



Questions?

Andreas.Schreiber@dlr.de

www.dlr.de/sc | [@DLR_software](https://twitter.com/DLR_software) | [@onyame](https://twitter.com/onyame)

